

UNITED STATES DISTRICT COURT  
DISTRICT OF NEW JERSEY  
CAMDEN VICINAGE

**IN RE:  
PAULSBORO DERAILMENT CASES**

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**MASTER DOCKET NO.:  
13-CV-784 (RBK/KMW)**

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13-CV-784 (RBK/KMW)**

1:12-CV-07468-RBK-KMW  
(Breeman)

1:12-CV-07747-RBK-KMW  
(Lord)

1:13-CV-03350-RBK-KMW  
(Everingham)

1:13-CV-03244-RBK-KMW  
(Morris)

1:13-CV-04569-RBK-KMW  
(Johnson)

1:13-CV-05763-RBK-KMW  
(Truluck)

1:13-CV-07410-RBK-KMW  
(Smith)

**PLAINTIFFS' BRIEF IN OPPOSITION TO DEFENDANTS'  
MOTION TO EXCLUDE THE EXPERT REPORT AND  
TESTIMONY OF DR. PANOS GEORGOPOULOS**

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## **I. Introduction**

The motion of Defendants Consolidated Rail Corporation, CSX Transportation, Inc., and Norfolk Southern Railway Company (“Defendants”) to exclude the testimony of Dr. Panos Georgopoulos is dishonest, offensive, and ultimately self-defeating. It is dishonest because it mischaracterizes his report, misstates his deposition testimony, and misrepresents EPA’s actual test data from Paulsboro. It is offensive because it smears a brilliant scientist who has served his adopted country with great distinction. It is ultimately self-defeating because when the lattice of Defendants’ prevarications, misrepresentations, and shoddy science is closely examined, it falls apart like a house of cards.

## **II. Argument**

### **A. Legal standard.**

“The Rules of Evidence embody a strong and undeniable preference for admitting any evidence which has the potential for assisting the trier of fact.” *Kannankeril v. Terminix Int’l Inc.*, 128 F.3d 802, 806 (3d Cir. 1997) (citation omitted); *see also* Fed. R. Evid. 402 (“Relevant evidence is admissible.”). If expert evidence is admissible, the trier of fact will determine the proper weight to give it. *Maloney v. Microsoft Corp.*, Civ. No. 09-2047, 2011 U.S. Dist. LEXIS 127870, at \*6-7 (D.N.J. Nov. 4, 2011).

In considering pre-trial challenges to expert testimony, Rule 702 has “three major requirements: (1) the proffered witness must be an expert, *i.e.*, must be qualified; (2) the expert must testify about matters requiring scientific, technical or specialized knowledge; and (3) the expert’s testimony must assist the trier of fact.” *Pineda v. Ford Motor Co.*, 520 F.3d 237, 244 (3d Cir. 2008). “A district court’s inquiry under Rule 702 is ‘a flexible one’ and must be guided by the facts of the case.” *ZF Meritor, LLC v. Eaton Corp.*, 696 F.3d 254, 294 (3d Cir. 2012).

**B. Dr. Georgopoulos is impeccably qualified.**

Dr. Georgopoulos is a professor in the Department of Environmental and Occupational Medicine at Rutgers University of the Robert Wood Johnson Medical School. He also directs the computational chemo dynamics laboratory there. He has a Ph.D. in Chemical Engineering from Cal-Tech. He has received honors and awards from the U.S. EPA, the National Society for Environmental Epidemiology, and the International Society for Exposure Analysis. His work has been supported by millions of dollars in grants from the U.S. EPA, the National Institute for Environmental Health Sciences, New Jersey’s Department of Environmental Protection, and the National Institute of Health, among other organizations. *See* Defs. Mot. at Exhibit B (Dr. Georgopoulos’s 84-page CV), pp. 15-24. He has served as a member of the Scientific Advisory Board for the EPA, and has served on scientific advisory panels for the EPA, including one on

inhalation dosimetry. He has authored or co-authored over 100 articles which have appeared in peer-reviewed journals and 11 book chapters. *Id.* at 25-35. His work includes four grants for studies of atmospheric modeling in connection with the World Trade Center disaster. *Id.* at 17-21. And he co-authored six peer-reviewed articles in connection with the World Trade Center disaster alone.

Defendants' contention that Dr. Georgopoulos is not an expert in the area of dense gas modeling, *see* Defs. Br. at 7-10, is absurd. His qualifications dwarf that of the Defendants' own air modeler, who published only six peer-reviewed papers, *none of which* dealt with dense gas modeling. *Cf.* Declaration of Panos Georgopoulos ("Georgopoulos Dec.", attached hereto) at Exhibit E (Schulman dep.), pp. 207:2-208:19). Notably, Dr. Georgopoulos spent "a couple years of my research life developing" a model called the "Achilles" project, to look at dense gases released from potential accidents and spills. Defs. Mot. at Ex. C ("Georgopoulos Dep."), p. 48; *id.* ("We have looked at dense gases as part of looking at potential accidents and spills and so on.").

The Achilles project specifically included leaks from railroad tank cars. *Id.* at 46-47. Dr. Georgopoulos's work has always included mixtures of pollutants which included dense gases and he has published many studies that involved heavier-than-air (*i.e.* dense) gasses. *See id.* at 49:18-22 ("[O]ver the past 25 years that I'm studying air pollution issues in New Jersey, I have looked at a wide

variety of gases, including dense gas.”). Although the emphasis of his published work was not “aspects of transport effected by the density,” those aspects *were* a major part of his work on the Achilles project. *Id.* at 49-51.

Dr. Georgopoulos thus easily satisfies the liberal qualification standard in this case. *See Pineda, supra*, 520 F.3d at 244 (“We have interpreted Rule 702’s qualification requirement liberally. We have held that a ‘broad range of knowledge, skills, and training qualify an expert.’”) (citation).<sup>1</sup>

**C. Dr. Georgopoulos properly accounted for wind speeds and direction in his model.**

Any contention that Dr. Georgopoulos failed to account for wind speeds for two hours and fifty minutes following the derailment (Def. Br. at 10-12) simply ignores his report and his deposition testimony. Dr. Georgopoulos looked to four

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<sup>1</sup> Defendants chide Dr. Georgopoulos for lacking sufficient experience modeling the mass release of vinyl chloride. *See* Defs. Br. at 8. But they ignore the fact that such experience would be extremely difficult to come by since, as Dr. Georgopoulos explained (and which should be obvious), “Vinyl chloride is not something that you would expect to see in the environment very often . . . in this type of quantity.” Georgopoulos Dep. at 47:22-48:1. Dr. Georgopoulos has experience modeling dense gases, and Defendants offer no reason why vinyl chloride specifically would escape his area of expertise. *Cf. Holbrook v. Lykes Bros. S.S. Co.*, 80 F.3d 777, 782 (3d Cir. 1996) (accepting more general qualifications in holding that a treating physician did not have to practice a particular specialty in order to testify concerning certain matters); *Cisson v. C. R. Bard, Inc. (In re C. R. Bard, Inc.)*, 948 F. Supp. 2d 589, 633 (S.D. W. Va. 2013) (even though expert did not have experience with the specific chemical material (polypropylene), district court permitted expert to testify because of his “extensive education and experience in biomaterials generally—which include polymers—and particularly as it relates to materials implanted in the human body.”).

sources for wind speed: the four local weather stations (Philadelphia Airport (KPHL), Philadelphia Northeast (KPNE), Wilmington/Newcastle (KILG), and Mt. Holly/South Jersey (KWAY)). *See* Georgopoulos Dep. at 105-106, 113-114.

As can be seen in Figure 3 to Dr. Georgopoulos's report, *see* Defs. Mot. at Ex. A ("Georgopoulos Report"), p. 10, the hourly average wind speed reported by these stations for the entire period from 7:00 a.m. to 10:00 a.m. was calm. Dr. Georgopoulos testified this did not mean that the air was perfectly *still*, but that there would be no *prevailing* wind and that the local microscale atmospheric motions would simply disperse the contaminant with similar probability to different direction due to a lack of a single prevailing wind direction. *See* Georgopoulos Dep. at 95:5-11 (Counsel: "What sort of environment would one have to have for this vapor to be present two hours later as a result of that release at 7 a.m.?" Dr. G.: "Very calm environment. Basically no prevailing wind direction."); *see also id.* at 130:12-131:2. Although Defendants claim that Dr. Georgopoulos "averaged" the data from the four stations, *see* Def. Br. at 10, this is not true. *See* Georgopoulos Dec. at ¶ 5. Dr. Georgopoulos input the weather station data into the model, and the model read the measurements and modeled a dispersion pattern based on that data. *See* Georgopoulos Dep. at 120.

What Dr. Georgopoulos did *not* do was use ASOS wind data from an elevation of *59-feet above sea level* to model wind current in Paulsboro at *5-feet*



*above sea level.* See Georgopoulos Dec. at ¶ 3. He rejected this faulty approach—used by Defendants’ expert—because:

The numbers that are measured at the location that is at high elevation and two miles apart with a body of water dividing them should not be used for fluctuating local measurements or as a substitute of the local near ground measurements because the actual flow near the ground could be completely different.

Georgopoulos Dep. at 205.

Dr. Georgopoulos continued:

Wind motions near the ground are always going to be lower in speed and could be different in direction, so you have to look at the whole picture in this is consistency between stations north, south, west and east of the location.

*Id.* at 115:9-16.

If you were in the street the wind flow above the rooftop of the buildings will not have the same direction as a the wind that you will experience at the corner of an intersection.

*Id.* at 58:3-8; *see also* Georgopoulos Dec. at ¶ 3(c) (“[I]t is well known that winds have higher velocities at higher altitudes and decrease as one gets lower to the ground.”). Even worse, Defendants’ experts at Exponent then increased the ASOS wind-speed by 0.6 mph based on an EPA recommendations for a ***completely different model***, which is contrary to good scientific practice ***and*** logic. *See generally* Georgopoulos Dec. at ¶ 3; *see also id.* at ¶ 3(d) (“I am not aware of any professional scientific literature that supports adding 0.6 mph to the wind velocity

when using a CFD model when considering near-ground dispersion of a dense gas.”).

Moreover, when examined at all four stations, the ASOS data showed no clear prevailing wind:

[It] shows a ‘chaotic’ picture with lack of prevailing wind direction that supports the use of the ‘calm’ approximation used in my model. Wind speeds and directions at the four stations are uncorrelated – directions often being opposite to each other (e.g. 150-180° apart) at a given moment. When the two minute data from these four stations are taken into account, it is obvious that there is no prevailing wind speed or direction [] across the region of concern during the first hours following the vinyl chloride release.

*See* Georgopoulos Dec. at ¶ 3(b), and Ex. C thereto.

Defendants’ exclusive reliance on data from KPHL is also unreliable because the Delaware River flows between KPHL and Paulsboro, and wind currents above a river generally follow the direction of the river current. *See id.* at ¶ 4(a). The nearest bank of the Delaware is only about a mile from the derailment site, yet Defendants’ model, which places great emphasis on the 6-foot deep channel of the 150-foot-wide Mantua Creek, completely ignores the impact of the Delaware River on wind direction in Paulsboro. *See id.*

Instead of picking and choosing from data to reach a preordained result, Dr. Georgopoulos used the most reliable, consistent wind data he could find, which was the hourly data for the four weather stations, which showed the lack of any prevailing wind. This was confirmed by videos showing fog persisting over the

area past 8:30 a.m., and eyewitness testimony described below, showing that the fog immediately spread into Paulsboro and did not, as the defense experts claim, blow away from Paulsboro until 8:22 p.m. *See* Georgopoulos Dep. at 19, 29; Georgopoulos Dec. at ¶¶ 9-10.

**D. Dr. Georgopoulos properly modeled the exposure based upon an instantaneous gaseous release over five minutes.**

Defendants criticize Dr. Georgopoulos's model for assuming vinyl chloride was released in gaseous form into the air over a few minutes. But that assumption is consistent with substantial evidence of record, including videos, photographs, and witness statements:

- Raelynn Stevenson described a vapor that looked like “the dust that came up the street that you saw on TV on 9/11. That’s what it looked like coming up to my house. It looked like the 9/11 dust.” Declaration of David Cedar, Esquire, Exhibit “A” (Raelynn Stevenson Statement to NTSB given December 2, 2012), p. 10:6-16. Before the accident, she said, the weather “was crystal clear. It was a beautiful morning.” *Id.* at p. 11:17-18.<sup>2</sup>
- Conrail’s engineer, Mark Mather, confirmed that “as soon as the top of the bridge went down it was almost instantaneously that the fog bank came up out of the Mantua Creek.” Declaration of David Cedar, Esquire, Exhibit “D” (Mather dep.) at 103:12-14. “You could tell it was massive, it was thick, it was dense.” *Id.* at 104:3-4. Conrail’s conductor confirmed that the fog was forming rapidly and expanding

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<sup>2</sup> The Paulsboro police report quotes both Ms. Stevenson and Ptlm. Jennifer Zubec as saying that no fog was present that day before the derailment. *See* Cedar Dec. Exhibit “F”.

out on the water. *See* Declaration of David Cedar, Esquire, Exhibit “E” (Den Ouden dep.) at 49:11-17.

- Mather added, “it was a breezeless day.” Mather dep. at 108:2-3 (emphasis added). As he took the engine towards the Paulsboro yard – about half a mile west of the wreck site, he saw the cloud “billowing towards the Paulsboro Yard office. ...Pretty much the whole neighborhood had a fog.” *Id.* at 112, 113:3-4, 19-20. And he could smell the sweet odor of vinyl chloride in the yard. *Id.* at 113:22-114:4. All of this happened before 7:45 a.m., during the time the Defendants’ experts say the wind was blowing the vinyl chloride away from Paulsboro. *Id.* at 160:8-20.
- The official Paulsboro Police report stated “as [the reporting officer] was speaking with the conductor I noticed a smoky fog start to swarm the immediate area and become very thick. The smoky substance that quickly surrounded me caused a reaction that made me cough several times.” Paulsboro Police Report.

The recorded communications by and with first responders further confirm the immediate presence of significant vinyl chloride fog in Paulsboro:

7:01 - the train “is spewing out all kinds of gas.” Glo. Cnty. 911 call

7:05 - “the creek is full of vapors from these cars.” Ch. 3 Fire Opps.

7:06 - “I have an odor out here that they are not familiar with. This odor is hazardous.” Zone 3 Police radio channel.

7:11 - “there is a lot of smoke coming from the creek area ***going towards Delaware Street***.” Zone 3 Police radio channel.

*See* Cedar Dec. Ex. “G” (emphasis added).

The Exponent report produced by Defendants assumed it would take longer—up to 11 minutes—for the gas to vaporize in part because they used the wrong pressure in doing their calculation. Exponent assumed the vinyl chloride was exposed at about 34 pounds per-square-inch, whereas the actual documents produced by Oxyvinyls, who actually loaded the car, showed the pressure was 85 – 90 psi, *at least 2 ½ times greater*. See Georgopoulos Dec. at Exhibit “E” (Schulman Dep.), 35:1-36:19; *id.* at ¶ 24; *cf. id.* at ¶ 18. Exponent’s own notes recognize that “the initial evacuation of the tank was quite rapid and likely quite violent so this assumption may not be entirely correct.” Georgopoulos Dec. at ¶ 25. It was, in fact, incorrect. *Id.* Dr. Georgopoulos used the pressure information supplied by Oxyvinyls and Conrail in doing the calculations for his model.

In any event, the 11-minute difference between the instantaneous gas release and a 90% liquid release predicted by Exponent is not material to the outcome. See Georgopoulos Dec. at ¶ 26. The difference between an instantaneous gaseous release and the 90% liquid release predicted by Exponent means, at most, that predicted concentrations would be delayed by 11 minutes. See Georgopoulos Dep. at 141:19-142:10. The defense experts admit that even if they used an instantaneous gas release, they cannot say their model would show a different dispersion pattern by 8:30 a.m.. See Georgopoulos Dec. at ¶ 26. Nor can they say their model would look any different at 8:00 o’clock, or even at 7:40. *Id.* Thus, as

Dr. Georgopoulos said: this aspect “doesn’t matter” to the analysis. Georgopoulos Dep. at 141:19-21.

**E. Dr. Georgopoulos’s terrain model mirrored the “open flat terrain” described by Defendants’ own experts.**

Defendants’ contention that Dr. Georgopoulos’s methodology is flawed for failure to appropriately capture terrain variations, *see* Defs. Br. at 15-17, such as the Mantua Creek channel, is demonstrably absurd and contradictory. Their own expert report describes the entire area between KPHL and Paulsboro as “open flat terrain with elevations near sea level.” Georgopoulos Dec. at ¶ 4. Unlike Plaintiffs’ model, which took a consistent approach with a gradual slope of terrain, Exponent picked and chose the data that would lower the exposures in Paulsboro, while ignoring data that would increase them. *See id.* Thus, Exponent emphasized a **6-foot** creek channel while ignoring the presence of thousands of homes – most at least **25-feet** high – dozens of commercial buildings, two refineries, and many thousands of trees, which Exponent admits could have delayed transport of vinyl chloride out of the area. *See id.* Similarly, while their terrain model makes the Mantua Creek bed seem like the Grand Canyon, it takes no account on the effect of the Delaware River and wind direction.

As one court astutely noted, the accuracy of an air dispersion model “depends upon the rigor applied in the input gathering process.” *Coleman v. Union Carbide Corp.*, Civ. No. 11-0366, 2013 U.S. Dist. LEXIS 140613, at \*67 (S.D. W.

Va. Sept. 30, 2013). Because the Exponent model completely ignores the impact of buildings which would have delayed the movement of vinyl chloride, and the Delaware River which could have altered their claimed wind direction of West to East, it provides no valid basis for excluding Dr. Georgopoulos's testimony.

**F. Defendants' 'failure to test' argument is a ruse.**

Defendants' contention that Dr. Georgopoulos's model is unreliable because of his failure to test his results against available air monitoring data is outrageous. The "available air modeling data" the Defendants cite is either completely bogus or, at best, highly unreliable. According to Defendants, EPA monitoring started at 8:45 a.m. in Paulsboro and all the readings the EPA found in Paulsboro from 8:45 a.m. to 12:00 p.m. were 0 ppm. *Cf.* Def. Br. at p. 20-21. However, this was simply a "draft" of data from the EPA which was completely erroneous, and quickly corrected. No measurements whatsoever were taken by EPA before 3:30 p.m. and the actual measurements used by the defendants at Dr. Georgopoulos's deposition started at 8:40 *p.m.* . . . **almost 12 full hours later.** *Compare* Cuker Dec. Ex. "A" (NJDEP 998-1) (the "draft" data used by Conrail) *with* Cuker Dec. Ex. "B" (NJ DEP A 0029-0042). Defendants' experts did not even notice that this data was in "draft" form and Defendants do not account for that obvious oversight now in their brief. While Defendants label Dr. Georgopoulos a "prevaricating" expert because he refused to rely on this "data," *see* Def. Br. at p. 23, this label is more properly

placed on Defendants themselves. Dr. Georgopoulos is permitted to reject data he considered unreliable without having his testimony barred; lest there be any doubt about his decisionmaking, it can be tested by the jury. *Cf. Abarca v. Franklin County Water Dist.*, 761 F. Supp. 2d 1007, 1071 (E.D. Cal. 2011) (groundwater expert's choice not to calibrate his data against field data that he concluded was unreliable presented a "scientific factual dispute" which must be weighed by the trier of fact).

Furthermore, the Paulsboro Refinery results heralded by Defendants do not provide a reliable yardstick for Dr. Georgopoulos's model, because those readings were greatly understated due to quality assurance issues. The same meters that Defendants cite as showing 193 and 111 ppm (Def. Br. at 19) had negative readings ranging from -40 to -60 ppm shortly afterwards. Negative readings cannot be reliable. Dr. Brian Buckley, an analytical chemist from Rutgers, reviewed the Paulsboro Refinery data and concluded that the actual vinyl chloride levels present in the air at the time the Paulsboro Refinery measurements were taken were "greatly in excess of the readings recorded by the device." Cuker Dec. Ex. "C" (Buckley Report) at p.3. The effect of not being able to zero the device



out and the effect of saturation would serve to skew the readings to a substantially lower number than was actually present.” *Id.*<sup>3</sup>

Defendants’ argument that Dr. Georgopoulos’s model is inconsistent with “personal and air sampling” from the Exxon lube plant in Paulsboro is even more absurd. This data is obviously unreliable on its face, *see* Georgopoulos Dec. at ¶ 6; it fails to indicate which of the three sample types “personal, area or source” was actually taken. It also shows four possible sample methods, tube, badge, direct read or filter – without saying which one was used. Without any chain of custody quality assurance quality control documents, no reasonable scientist doing air modeling would rely on this data to any extent whatsoever in evaluating the acceptability of the model. *See id.*

Even if the data in question were systematic and reliable, Dr. Georgopoulos’s model falls within an acceptable range. It is generally accepted among air modeling scientists that a model is reliable if the model’s predictions are within a factor of 2-3 of systematically collected, valid measurements. *See* Georgopoulos Dec. at ¶ 21. In any event, to the extent that some isolated

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<sup>3</sup> If the negative number is simply added to the reading (which Dr. Buckley emphasizes would still understate the actual reading), Dr. Georgopoulos’s readings are actually quite consistent with what the Paulsboro Refinery results likely signify. We know that the reading of 193 ppm must mean at least 253 ppm because the same device has a reading of -60, and likely means something in excess of that. When multiplied by the 1.0 factor, that results in a reading of over 480 ppm which is well within the 400-4,000 ppm range estimated by Dr. Georgopoulos’s model.

measurements are inconsistent with the SCIPUFF model, that evidence goes to weight, not admissibility. *Hartle v. First Energy Generation Corp.*, 7 F. Supp. 3d 510, 519 (W.D. Pa. 2014) (also holding that a model with a factor-of-two error rate is generally accepted and admissible); *see also Hartle v. FirstEnergy Generation Corp.*, Civ. Nos. 08-1019; 08-1025; 08-1030, 2014 U.S. Dist. LEXIS 43033, at \*20 (W.D. Pa. Mar. 31, 2014) (emphasizing that “insufficient pretesting, improper information gathering, confusion by respondents, nonrepresentative and nonrandom sampling, hypothetical bias, error rate, and inconsistent and unconventional statistical analysis are ‘technical flaws’ that go to [] weight rather than admissibility.”).

**G. Overwhelming scientific evidence shows that vinyl chloride degrades to hydrochloric acid and formaldehyde.**

The ATSDR’s Toxicological Profile for Vinyl Chloride states that vinyl chloride “has an atmospheric half-life of 18 hours based on a hydroxyl radical concentration of  $1.5 \times 10^6$ . *See Cedar Dec.* at Exhibit “V” (ATSDR Tox. profile), p. 179 (“The products of this reaction ***are hydrochloric acid, formaldehyde...***”) (emphasis added). Dr. Georgopoulos’s opinions on degradation products are grounded in these indisputable scientific facts.

Defendants argue that vinyl chloride only decays in strong sunlight and even then, only decays to formyl chloride which then stays around for “days.” However, as Dr. Georgopoulos testified: “Anyone with a chemical engineering

background knows that formyl chloride is not a stable compound.” Georgopoulos Dep. at 182. Defendants go on to misquote his deposition when they say that he “conceded that there were no studies supporting his contention that the vinyl chloride release during the derailment would degrade into ... formyl chloride or hydrochloric acid.” Def. Br. at 22. In fact, it is undisputed that vinyl chloride would decompose to formyl chloride. The only reason there are no open air studies showing the formyl chloride will decompose to hydrochloric acid is because formyl chloride is inherently unstable and such experiments can *only* be conducted in a laboratory. *See* Georgopoulos Dec. at ¶ 11; Georgopoulos Dep. at 183:2-184:16.

The opinion of Defendants’ experts—that formyl chloride would not decompose in the atmosphere—defies the scientific consensus on the unstable nature of formyl chloride documented in standard and highly respected textbooks as well as in a wide range of research articles. Georgopoulos Dec. at ¶ 12. Formyl chloride would be expected to decompose on any surfaces in the air, including the particulate one would expect in a normal urban environment such as Paulsboro and the fog particles which permeated the air in the derailment area. Georgopoulos Dec. at ¶ 14.

Thus, the Defendant’s apparent contention that formyl chloride only decomposes on glass surfaces is thus utterly without any scientific support.

**H. Defendant's attack on Dr. Georgopoulos's opinion about degradation products is based on badly flawed science.**

Environ also used an obsolete number and methodology to calculate a purported degradation rate for vinyl chloride to its degradation compounds. First, the method Environ used base line of hydroxyl radicals (OH) of  $1 \times 10^6$  per cubic centimeter. This baseline is actually the very lowest end of a range noted in an air chemistry textbook by distinguished chemist Mark Jacobson ( $1 \times 10^6$  to  $1 \times 10^7$ ) for urban air, and comes from a 1999 textbook. *Cf.* Georgopoulos Dec at ¶ 16.

By relying solely on the 1999 reference, Environ ignores recent studies showing that the OH concentrations are much higher than was known at the time that textbook was written, ranging as high as  $2.7 \times 10^6$  – more than 2 ½ times what Environ estimated. Georgopoulos Dec. at ¶¶ 15-18. Indeed, although Environ claims that OH readings would be virtually zero at night, a study in Houston, which like Paulsboro is an urban environment with a refinery, and thus more likely to have higher OH concentrations, showed night time levels of  $1 \times 10^6$ , equal to Environ's daytime level! *Cf. id.* at ¶ 19. Dr. Georgopoulos's model used a baseline OH of  $1.5 \times 10^6$ , which is exactly the same as that used by the ATSDR in its toxicological Profile of Vinyl Chloride. *See id.* at ¶ 16.

Aside from mistakenly using an unreasonably low baseline OH concentration of  $1.0 \times 10^6$ , the Environ report uses a completely novel and untried

methodology by assuming that the OH level would vary in direct proportion to the UVA percentage. There is no scientific basis for this methodology. It has never been used before, and the articles previously cited all show that OH can be produced at nighttime as well so that its production is not directly proportional to the UV indicator used by Environ. *Id.* at ¶ 19.

The novel methodology used by Environ to determine the level of OH in the air is utterly without scientific basis. Environ used the degree of solar radiation (UV-A) at each time period, multiply that past a baseline hydroxyl concentration of  $1.0 \times 10^6$  to arrive at an estimated decomposition rate for vinyl chloride. *See id.* This assumes that without sunlight the OH concentration in the atmosphere would be zero. *See id.* The Houston data demonstrates this assumption is totally false. As in Houston, a nighttime concentration was  $1.0 \times 10^6$  equal to the daytime concentration estimated by Environ. *See id.*

\* \* \*

“*Daubert* neither requires nor empowers trial courts to determine which of several competing scientific theories has the best provenance. It demands only that the proponent of the evidence show that the expert’s conclusion has been arrived at in a scientifically sound and methodologically reliable fashion.” *Ruiz-Troche v. Pepsi Cola of Puerto Rico Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998). Here, Dr. Georgopoulos’s air model was the product of a highly methodical, intensely fact-

supported effort. All Defendants can do is pick around the edges, but they never come close to dealing a direct hit, let alone a fatal blow requiring exclusion.

*Daubert* thus requires that Dr. Georgopoulos be permitted to testify before the trier of fact.

### **III. Conclusion**

For all the reasons stated above, Defendants' motion to exclude the testimony of Dr. Georgopoulos should be denied.

Dated: June 19, 2015

Respectfully submitted,

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Dated: June 19, 2015

**CERTIFICATE OF SERVICE**

I hereby certify that on the date below, a true and correct copy of Plaintiffs' Brief in Opposition to Defendants motion to exclude the testimony of Dr. Panos Georgopoulos, and all documents in support thereof, was electronically filed using the Court's CM/ECF system and will therefore be served by electronic means via the Court's ECF Notification system upon all counsel of record. I further certify that the plaintiffs in *Mackenzie*, 1:15-cv-00578-RBK, will be served by First Class U.S. Mail.

Dated: June 19, 2015

/s/ Joseph Alan Venti  
Joseph Alan Venti, Esq.